IN THE CLAIMS:

1. (Currently Amended) A method for detecting a marker in an image, comprising the steps of:

selecting one of a first marker recognition process based on a normalized correlation and a second marker recognition process based on gray value histograms;

extracting image features associated with an input image of a ROI (region of interest); and

comparing the extracted image features with a trained model associated with the selected recognition process to determine if a marker is present in the input image,

wherein if the first marker recognition process is selected, the trained model comprises at least one template image and the step of comparing comprises the steps of:

normalizing the template image and input image with respect to brightness;

computing a correlation between the normalized template image and input image; and

determining that a marker is present in the input image if the computed correlation meets a threshold.

2. (Canceled)

3. (Currently Amended) The method of claim 1 ~~2~~, wherein the step of normalizing comprises computing $I(i) = \frac{(I(i) - \mu)}{\sigma}$, where ***I(i)*** is the gray value of pixel ***I*** and where μ and σ denote the average brightness and contrast, respectively.

4. (Currently Amended) The method of claim 1 ~~2~~, wherein the step of computing a correlation comprises computing $\rho = \sum_{allpixels} I(i) * T(i)$) where ρ comprises the correlation coefficient, I comprises the input image, and T comprises the template image.

5. (Currently Amended) The method of claim 1 ~~2~~, wherein the at least one template image comprises an image comprising a target marker [[,]] or an image not comprising a target marker, ~~and both~~ or wherein the trained model comprises multiple template images including an image comprising a target marker and an image not comprising a target marker.

6. (Currently Amended) The method of claim 1 ~~2~~, further comprising the step of computing the template image from an ~~the~~ average of a plurality of template images.

7. (Currently Amended) The method of claim 1 ~~2~~, wherein the step of computing a correlation further comprises computing a correlation between at least one other normalized template image and the input image; and wherein the step of determining if a marker is present in the input image is based on a maximum computed correlation.

8. (Currently Amended) The method of claim 1 ~~2~~, further comprising the step of reducing the resolution of the input image and the template image by a predetermined factor prior to the comparing step.

9. (Original) The method of claim 1, wherein if the second marker recognition process is selected, the trained model comprises a sample image histogram comprising a gray value distribution of a sample image and the step of comparing comprises the steps of:

generating an input image histogram comprising a gray value distribution of the input image;

computing a distance measure between the input image histogram and the sample image histogram; and

determining if a marker is present in the input image based on the computed distance measure.

10. (Original) The method of claim 9, wherein the step of generating an input image histogram comprises generating a global histogram.

11. The method of claim 9, wherein the step of generating an input image histogram comprises generating a plurality of local histograms.

12. (Currently Amended) A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method steps for detecting a marker in an image, the method comprising the steps of:

selecting one of a first marker recognition process based on a normalized correlation and a second marker recognition process based on gray value histograms;

extracting image features associated with an input image of a ROI (region of interest); and

comparing the extracted image features with a trained model associated with the selected recognition process to determine if a marker is present in the input image,

wherein if the first marker recognition process is selected, the trained model comprises at least one template image and the step of comparing comprises instructions for:

normalizing the template image and input image with respect to brightness; and

computing a correlation between the normalized template image and input image;

determining that a marker is present in the input image if the computed correlation meets a threshold.

13. (Canceled)

14. (Currently Amended) The program storage device of claim 12 ~~13~~, wherein the instructions for normalizing comprise instructions for computing $I(i) = \frac{(I(i) - \mu)}{\sigma}$, where ***I(i)*** is the gray value of pixel ***I*** and where μ and σ denote the average brightness and contrast, respectively.

15. (Currently Amended) The program storage device of claim 12 ~~13~~, wherein the instructions for computing a correlation comprise instructions for computing $\rho = \sum_{allpixels} I(i) * T(i))$ where ρ comprises the correlation coefficient, ***I*** comprises the input image, and ***T*** comprises the template image.

16. (Currently Amended) The program storage device of claim 12 ~~13~~, wherein the at least one template image comprises an image comprising a target marker [[,]] or an image not comprising a target marker, ~~and both~~ or wherein the trained model comprises multiple template images including an image comprising a target marker and an image not comprising a target marker.

17. (Currently Amended) The program storage device of claim 12 ~~13~~, further comprising instructions for computing the template image from an ~~the~~ average of a plurality of template images.

18. (Currently Amended) The program storage device of claim 12 ~~13~~, wherein the instructions for computing a correlation further comprise instructions for computing a correlation between at least one other normalized template image and the input image; and wherein the step of determining if a marker is present in the input image is based on a maximum computed correlation.

19. (Currently Amended) The program storage device of claim 12 ~~13~~, further comprising instructions for the step of reducing the resolution of the input image and the template image by a predetermined factor prior to the comparing step.

20. (Currently Amended) The program storage device of claim 12 ~~13~~, wherein if the second marker recognition process is selected, the trained model comprises a sample image histogram comprising a gray value distribution of a sample image and the instructions for the step of comparing comprise instructions for:

generating an input image histogram comprising a gray value distribution of the input

image;

computing a distance measure between the input image histogram and the sample image histogram; and

determining if a marker is present in the input image based on the computed distance measure.

21. (Original) The program storage device of claim 20, wherein the instructions for generating an input image histogram comprise instructions for generating a global histogram.

22. (Original) The program storage device of claim 20, wherein the instructions for generating an input image histogram comprise instructions for generating a plurality of local histograms.

23. (Currently Amended) A system for recognizing a marker in an image, comprising:

an image capture module for extracting image features associated with an input image of a ROI (region of interest);

an image processor comprising a first marker recognition processor for recognizing a marker in the input image based on a template recognition normalized correlation method that normalizes a template image and input image with respect to brightness ~~normalized correlation~~ and a second marker recognition processor for recognizing a marker in the input image based on gray value histograms; and

a database comprising one of trained template images and trained histograms and a combination thereof, which are used by the image processor during a recognition process.

24 (Original) The system of claim 23, wherein the system is implemented in an automated placement system for detecting markers on printed circuit boards.